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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,083	01/23/2004	Thomas L. Szabo	US020287A	8237

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS  
P.O. BOX 3001  
BRIARCLIFF MANOR, NY 10510

EXAMINER
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MUSSELMAN, TIMOTHY A

ART UNIT	PAPER NUMBER
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3714

MAIL DATE	DELIVERY MODE
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10/09/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/764,083	Applicant(s) SZABO ET AL.	
	Examiner Timothy Musselman	Art Unit 3714	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/1/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some    \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                        |                                                                   |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____                                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/04</u> .                                                    | 6) <input type="checkbox"/> Other: ____                           |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

**Claims 10 and 21 are rejected under 35 U.S.C. 112, 1<sup>st</sup> paragraph, for failing to comply with the enablement requirement.**

**Claims 10 and 21** refer to "polynomial time division deconvolution". However, "polynomial time division" does not appear to be a term in that is in use in the area of mathematics. Examiner is unable to find an explanation for this term in applicant's specification, on the world wide web, or in the patent database. If this is a commonly accepted term, applicant is invited to advise examiner of such in the response to this action with appropriate evidence. Until such a time, these claims cannot be considered, and additionally one of ordinary skill in the art would not be sufficiently enabled to create this invention.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the relevant portion of 35 U.S.C. 102 that forms the basis for the rejections made in this section of the office action;

(e) the invention was described in — (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant

for patent.

**Claims 1-6, 11-17, and 22-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Bolorforosh et al. (US 6,673,016).**

**Regarding claims 1, 11, and 26,** Bolorforosh discloses an ultrasound imaging system comprising means for identifying an impulse response of a transmit channel of the ultrasound imaging system. See col. 11: 11-17. Bolorforosh further discloses means for selecting a desired transmit channel signal spectrum defined by an envelope and a center frequency, and means to determine and apply an excitation signal to the transmit channel that will produce the desired signal. See col. 9: 6-14. Bolorforosh further discloses means for receiving a reflected signal centered about a harmonic of the transmit center frequency. See col. 10: 36-38. Bolorforosh further discloses means for selecting a filter function to apply to the reflected signal. See col. 8: 16-25. Bolorforosh further discloses means for identifying the impulse response of the receive channel of the system, and means for formulating a receive channel filter responsive to the selected filter function and the impulse response. See col. 11: 25 – col. 12: 19.

**Regarding claims 22 and 29,** Bolorforosh discloses an ultrasound imaging system with a switch coupled to a transducer, wherein the switch is positioned to apply an excitation signal with a center frequency to the transducer in a transmit mode of the system. See col. 13: 53-58. Bolorforosh further discloses a signal shaper coupled to the switch, the signal shaper further configured to generate the excitation signal, the signal shaper further configured to adjust the excitation signal in response to the impulse response of the transmit channel such that a desired ultrasound energy waveform is generated by the transducer. See col. 8: 23-25. Bolorforosh further discloses a receive channel signal shaper coupled to the transducer, the receive channel signal shaper comprising a filter, the filter formulated in response to the receive channel impulse response and a desired echo response signal spectrum, the filter further configured to process the ultrasound echo response at a harmonic of the center frequency. See col. 11:25 – col. 12:19.

Art Unit: 3714

**Regarding claims 2-3 , 12-13, 24, and 28**, Bolorforosh further discloses wherein the transmit channel spectrum can be symmetric and Gaussian. See col. 11: 53-63 and the figures referred to therein.

**Regarding claims 4-5 and 15-16**, Bolorforosh further discloses wherein the determination of the impulse response of the transmit channel can be by measurement or calculation. See col. 11: 18-41.

**Regarding claims 6 and 17**, Bolorforosh further discloses wherein the excitation signal is a function of the impulse response and the desired transmit spectrum. See col. 11: 53-63.

**Regarding claims 14 and 25**, Bolorforosh further discloses wherein the desired receive channel filter function has a center frequency at a harmonic multiple of the fundamental frequency of the excitation signal. See col. 9: 7-25 and col. 11: 53-63.

**Regarding claims 23 and 27**, Bolorforosh further discloses wherein the passband is in a range capable for harmonic imaging. See col. 10: 11-19.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of the relevant portion of 35 U.S.C. 103 that forms the basis for the rejections made in this section of the office action;

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Art Unit: 3714

**Claims 7-8 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolorforosh et al. (US 6,673,016) in view of Sieben et al. (US 5,243,988).**

**Regarding claims 7-8 and 18-19,** Bolorforosh discloses producing excitation waveforms to generate desired acoustic output functions, see col. 9: 7-24, but there is no teaching wherein the generation of this excitation signal comprises deconvolution and inverse Fourier transforms. However Sieben discloses an ultrasound device that teaches of utilizing deconvolution and inverse Fourier transforms for processing and analysis of various signals. See col. 36:11-23. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize this same type of analysis with the desired output function and impulse response function of Bolorforosh in order to obtain the excitation signal that produces the desired output from the transducer.

**Claims 9 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolorforosh et al. (US 6,673,016) in view of Sieben et al. (US 5,243,988) and in further view of Pratt, Jr. et al. (US 4,913,157).**

**Regarding claims 9 and 20,** Bolorosh/Sieben disclose all of the limitations of the parent claims as described above, but fail to disclose wherein the deconvolution process utilizes Weiner filters. However, the use of Weiner filters for deconvolution signals is old and well known in the art as disclosed by Pratt in col. 16: 1-12, and such a use would have been obvious to one of ordinary skill in the at the time of the invention.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy Musselman whose telephone number is (571)272-1814. The examiner can normally be reached on Mon-Thu 6:00AM - 4:30PM.


Art Unit: 3714

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pezzuto can be reached on (571)272-6996. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Ronald Laneau  
Supervisory Primary Examiner  
Art Unit 3714